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1	Published release	JTS	

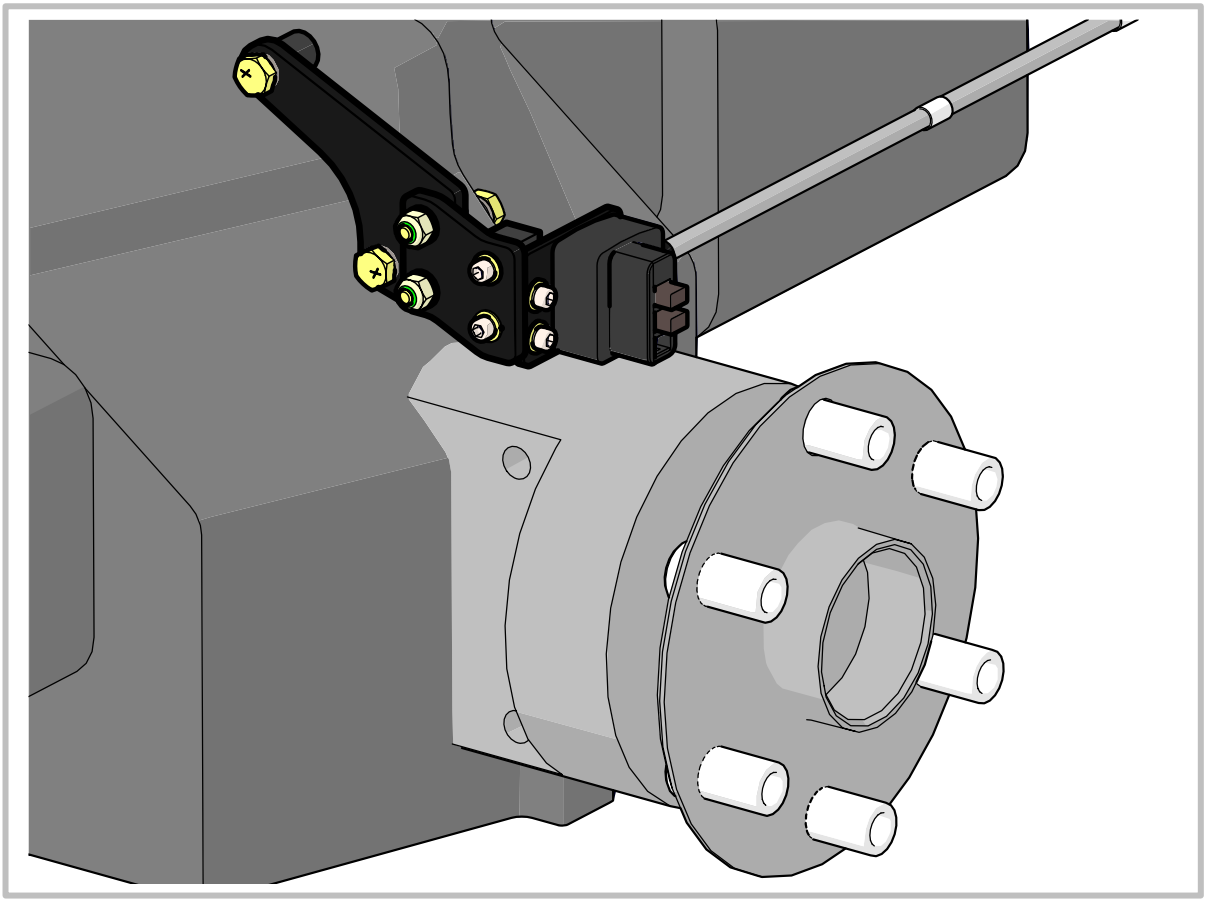
Airmaster Propellers Ltd
20 Haszard Rd, Massey,
Auckland 0614, NZ

Phone: (+64) 9 833 1794
E-mail: support@propellor.com
Web: www.propellor.com

ASI-4-8-6

SENSOR-BRUSH INSTALLATION (LYCOMING ENGINE)

PROCEDURE



SUBJECT:	
Sensor-Brush Installation	
ASSEMBLY NO:	**APPLICABILITY:**
AR-LS(+RG)	All propeller models used with a Lycoming engine

1. TOPIC

1.1 Introduction

This document covers the procedure for mounting an Airmaster sensor-brush assembly to a Lycoming engine and assembly of the dedicated multi-component brush bracket system.

The existence of the starter ring gear in Lycoming engines interferes with the normal position of the slipring behind the spinner backplate. As a result, the slipring is mounted inside the starter ring gear, and a multi-component sensor-brush bracket assembly is required.

It is recommended that installers mount the hub and ring gear assembly to the engine flange and attach the sensor-brush assembly to the brush block cover plate before proceeding.

> ⓘ *Note*
> *The illustrations in this document do not show the hub (and at times, the Lycoming ring gear) mounted to the engine flange. This is to illustrate the sensor-brush mounting components more clearly as they would otherwise be obstructed from view.*

1.2 Prerequisites

- Mount hub and ring gear to engine flange in accordance with procedure ***ASI-4-4-5***.
- Inspect brushes for signs of damage or defect. Check brushes travel smoothly and evenly through the brush holder when they are compressed.
- Attach Lycoming sensor-brush block (*A0122*) to brush plate (*P0877*) in accordance with procedure ***ASI-4-8-1***.

> ⓘ *Note*
> *Generally, new propellers are supplied with the sensor-brush assembly pre-fitted to its mounting plate, but in some cases, this must be performed by the installer.*

- Install Lycoming slipring assembly in accordance with procedure ***ASI-4-3-3***.

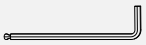
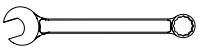
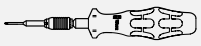
> ⓘ *Note*
> *Generally, ring gears are pre-machined by Airmaster to suit the propeller, and the slipring is installed.*

2. MATERIAL REQUIREMENTS

2.1 Parts

ITEM	QTY	PART NO.	DESCRIPTION	IMAGE
1.	1	A0122	Airmaster Sensor-Brush Assembly (for Lycoming)	
2.	1	AR-LS(+RG)	Airmaster Lycoming Slipring Assembly (incl. Ring Gear)	

2.2 Tooling

ITEM	QTY	DESCRIPTION	IMAGE
1.	1	9/64” Hex Key	
2.	2	7/16” Spanner	
3.	1	Torque Screwdriver (9/64” Hex)	
4.	1	Torque Screwdriver (3/8” Socket)	

2.3 Consumables

ITEM	QTY	DESCRIPTION	IMAGE
1.	As required	Cleaning Agent (Non-Corrosive) *(e.g. Loctite® SF 7063, Methylated Spirits)*	
2.	As required	Paper Towels, Clean Cloth (or similar)	
3.	As required	Torque-Seal	
4.	As required	Piece of Card	
5.	As required	Loctite 243	

2.4 Paperwork

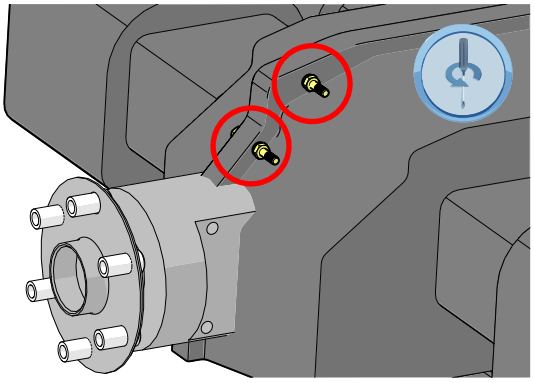
ITEM	QTY	CODE	DESCRIPTION
1.	1	AR-LS(+RG)	Airmaster Lycoming Slipring Assembly (incl. Ring Gear) Drawing & BoM

3. PROCEDURE

3.1 Mount Sensor-Brush Bracket (Lycoming)

PROCEDURE

Step 1 Remove Crankcase Screws

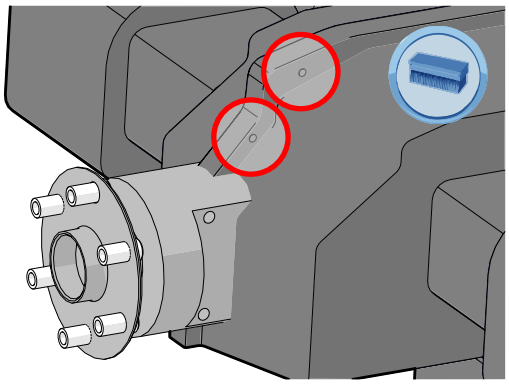


- Remove (2) forward-most AN4 bolts, washers, and nuts from the Lycoming engine crank case.

Attention *(2) 7/16” Spanners*

Note *Store in case needed for future use.*

Step 2 Clean Mounting Holes

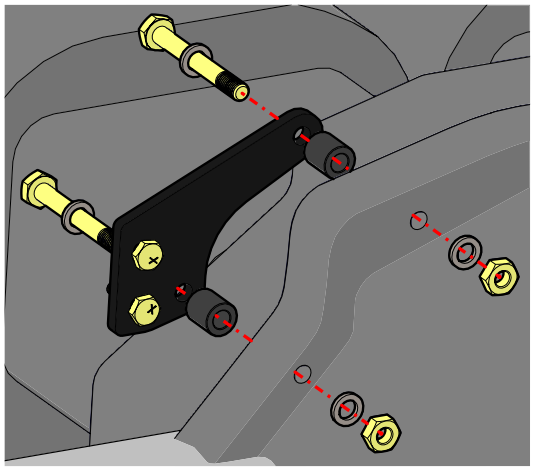


- Clean (2) holes and surface surrounding the area where the bolts were removed.

Caution
Any paint or debris left remaining in this area may lead to misalignment of the brushes and sliprings.

Attention *Cleaning agent, Paper towel*

Step 3 Mount Bracket-A



- Mount Bracket-A to crankcase by assembling (2) sets of the following components from the left (facing front of engine) in sequence:

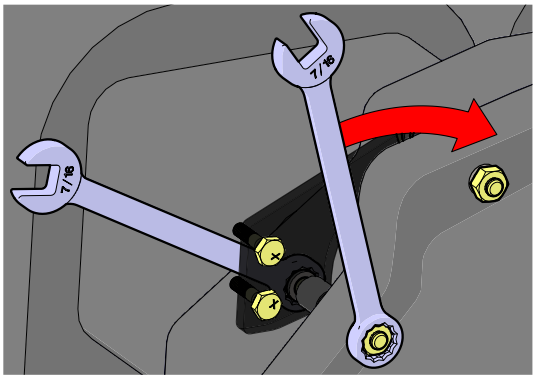
AN4 bolt	(*P0887-x*)
Nord-Lock® washer pair	(*P0890*)
Bracket A	(*P0878*)
Spacer	(*P0875*)
(Through engine crankcase)	
Nord-Lock® washer pair	(*P0890*)
AN4 Nut	(*P0888*)

Note
There is no requirement to lock-wire bolts when Nord-Lock® washers are used. Refer to correct use of Nord-Lock® washers.

Step 4 Secure Bracket-A

- Torque both nuts to **10Nm (7.4ft-lbs)** whilst restraining bolt head.
- Indicate with torque-seal.

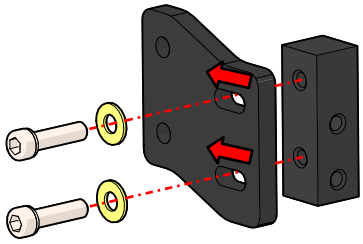
> *Attention*
> *7/16" Spanner, Torque screwdriver, Torque-seal*



Step 5 Assemble Bracket-B

- Attach Bracket-B (*P0879*) to connecting block (*P0876*) in **rear-most position** using (2) 8-32 UNC cap screws (*P0865*) and #8 washers (*P0163*) finger tight.

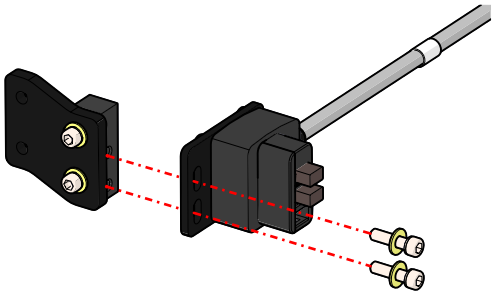
> *Attention* *9/64" Hex key*



Step 6 Assemble Brush Block

- Attach brush plate (with sensor-brush block attached) to connecting block using (2) 8-32 UNC cap screws and #8 washers finger tight.

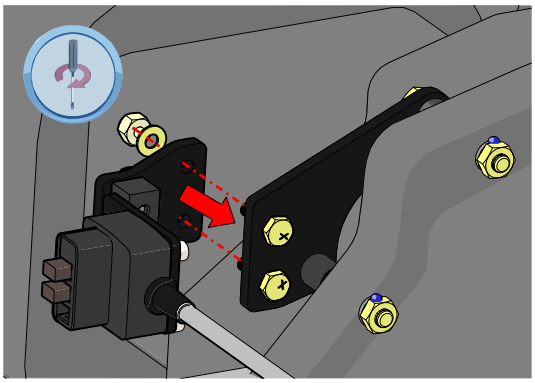
> *Attention* *9/64" Hex key*



Step 7 Mount Bracket B

- Slide Bracket-B and its assembled parts onto the (2) AN3 studs protruding from Bracket-A.

> ***Caution***
> *The carbon brushes are delicate, and side-loading should be avoided. While the sensor-brush assembly is positioned, use a piece of card to compress the brushes as they slide across the propeller's slipring assembly (inside ring gear).*



- Secure Bracket-B with (2) #10 washers and 10-32 UNF locknuts (*P0156*).
- Torque locknuts to **2.5Nm (1.9ft-lbs)**.

> *Note*
> *The AN3 studs do not need to be restrained as they are fixed to Bracket-A with thread locker.*

> *Attention* *Torque screwdriver (3/8" socket)*

3.2 Position Sensor-Brush Block (Lycoming)

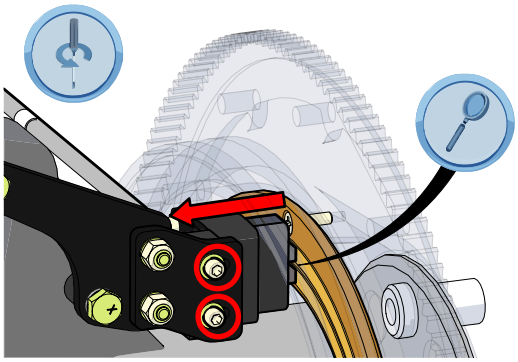
PROCEDURE

Step 1 Back Off Sensor-Brush Block

- If not done, adjust sensor-brush block to rear-most position by loosening (2) cap screws on side of brush plate, so that brush/slipring alignment can be observed.

Attention *9/64” Hex key*

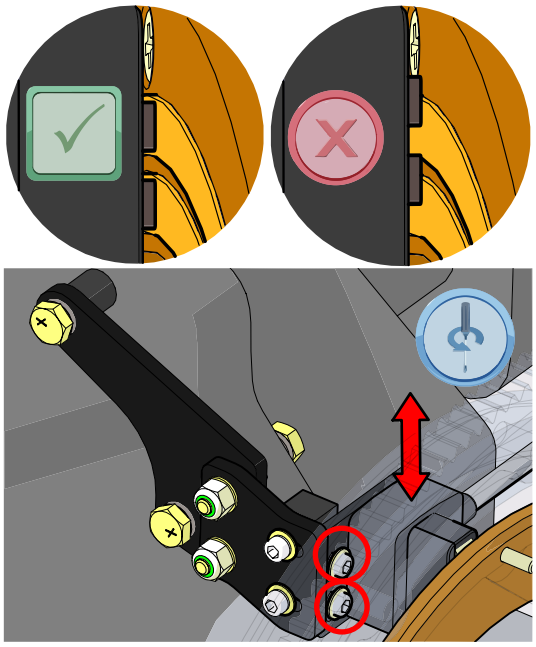
Note
A torch and inspection mirror may be useful.



Step 2 Check Sensor-Brush Alignment

- Check carbon brushes align centrally with their respective sliprings and do not overlap.
- If this condition is not met, adjust the position of the brush plate by loosening the cap screws at the front. Retighten once correct alignment is achieved.

Attention *9/64” Hex key*

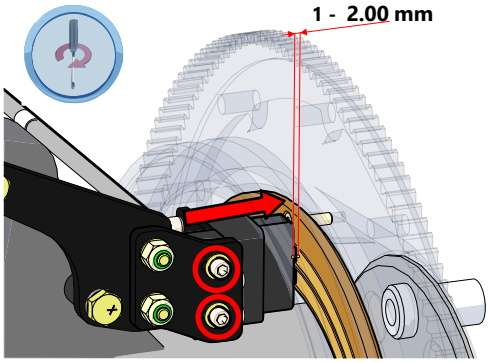


Step 3 Set Sensor-Brush Block Stand-Off

- Adjust sensor-brush block forward to achieve a gap of approx. **1-2mm (0.08in)** between the front of the brush block and the slipring face.
- Retighten cap screws on side of brush plate.

Note *A feeler gauge may be useful.*

Attention *9/64” Hex key*



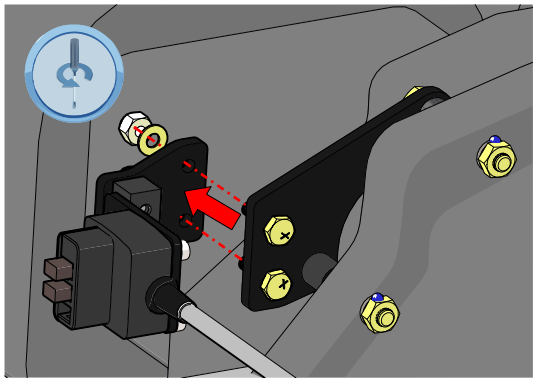
3.3 Lock Sensor-Brush Block

PROCEDURE

Step 1 Remove Bracket Assembly

- Remove (2) locknuts and washers securing Bracket-B to Bracket-A.
- Remove Bracket-B and its assembled parts as one unit.

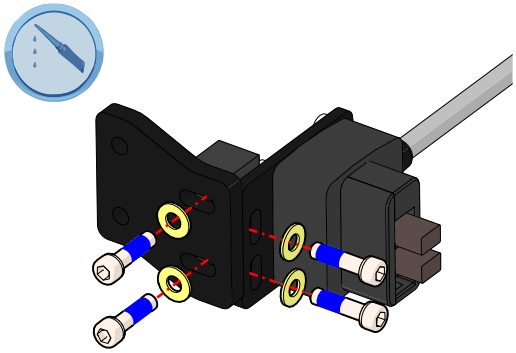
Attention *3/8" Spanner*



Step 2 Lock Brush Block Cap Screws

- Remove (4) 8-32 UNC cap screws one at a time from connecting block (to ensure that brush block position is not altered) and reinstall with a thin stripe of Loctite 243 applied to the threads.
- Torque cap screws to **2Nm (1.5ft-lbs)**.
- Indicate with torque-seal.

Attention
Torque Screwdriver (9/64" Hex), Loctite 243, Torque-seal

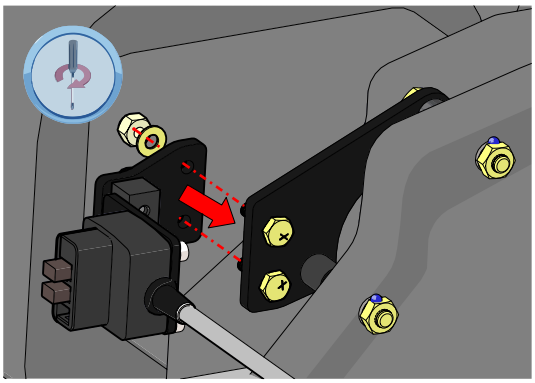


Step 3 Remount Bracket B

- Reattach Bracket-B to Bracket-A with (2) #10 washers and 10-32 UNF locknuts (*P0156*).

Caution
The carbon brushes are delicate, and side-loading should be avoided. While the sensor-brush assembly is positioned, use a piece of card to compress the brushes as they slide across the propeller's slipring assembly (inside ring gear).

Note
The AN3 studs do not need to be restrained as they are fixed to Bracket-A with thread-locker.



- Torque locknuts to **2.5Nm (1.9ft-lbs)**.
- Indicate with torque-seal.

Note
The brush block should be removed in the future (e.g. for brush replacement) by removing locknuts and removing Bracket-B and its assembled parts as

one unit. Do not undo cap screws now that sensor-brush position has been set. Lock nuts can only be reused once, replace after next use.

Attention
Torque screwdriver (3/8” socket), Torque-seal

3.4 Subsequent Action

Perform the following tasks once this procedure is complete:

- Connect sensor-brush assembly cable to extension loom (*A0125-x*). This loom is routed through the engine bay and connected to the controller [CN2].